

Task 47 Glossary and terms

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The origin of the terms is showed in brackets. Most of the energy definitions below are taken from the European EN 15603:2008.

ENERGY

Primary energy PE [kWh] (EN 15603:2008)

Energy that has not been subjected to any conversion or transformation process.

Notes:

- *Primary energy includes non-renewable energy and renewable energy. If both are taken into account it can be called total primary energy.*
- *For a building, it is the energy used to produce the energy delivered to the building. It is calculated from the delivered and exported amounts of energy carriers, using conversion factors.*
- *From task 47 template: Primary energy consumption is defined as delivered energy multiplied with primary energy factors*

Delivered energy [kWh] (EN 15603:2008 / ISO 13790)

Energy, expressed per energy carrier, supplied to the technical building systems through the system boundary, to satisfy the uses taken into account (heating, cooling, ventilation, domestic hot water, lighting, appliances etc.) or to produce electricity.

Notes:

- *For active solar and wind energy systems the incident solar radiation on solar panels or collectors or the kinetic energy of wind is not part of the energy balance of the building. It is decided at national level whether or not renewable energy produced on site is part of the delivered energy.*
- *Delivered energy can be calculated for defined energy uses or it can be measured.*
- *Delivered energy is sometimes referred to as "site energy" and "purchased energy".*

Exported energy (EN 15603:2008)

Energy, expressed per energy carrier, delivered by the technical building systems through the system boundary and used outside the system boundary.

Notes:

- *It can be specified by generation types (e.g. CHP, PV, etc) in order to apply different weighting factors.*
- *Exported energy can be calculated or it can be measured.*

Net delivered energy (EN 15603:2008)

Delivered minus exported energy, both expressed per energy carrier.

Notes:

- *A balance of the delivered and exported energy per energy carrier can be performed only if the same primary energy factors and/or CO₂-coefficients apply to the delivered and exported amounts of that energy carrier.*
- *The term "net" can also be applied to quantities derived from net delivered energy, e.g. primary energy or CO₂*

Total primary energy factor (EN 15603:2008)

For a given energy carrier, non-renewable and renewable primary energy divided by delivered energy, where the primary energy is that required to supply one unit of delivered energy, taking account of the energy required for extraction, processing, storage, transport, generation, transformation, transmission, distribution, and any other operations necessary for delivery to the building in which the delivered energy will be used.

Note:

- *The total primary energy factor always exceeds unity.*

Embodied energy [MJ/kg product] (*Wikipedia*)

Embodied Energy is the sum of all the energy required to produce goods or services, considered as if that energy was incorporated or 'embodied' in the product itself.

Note:

- A product that requires large amounts of energy to obtain and process the necessary raw materials or a product that is transported long distances during processing or to market, will have a high embodied energy level.

Grey energy [MJ/kg product] (*IEA SHC task 47 subtask D*)

Grey energy is the energy required by all the transformations undergone by a product throughout its life cycle.

Notes:

- Grey energy is the energy stored in materials and theoretically recoverable at the end of life + the energy used in operations of processing, operating and transportation over its life cycle.

Auxiliary energy [kWh] (*EN 15602:2008 / ISO 13790*)

Electrical energy used by technical building systems for heating, cooling, ventilation, and/or domestic water to support energy transformation to satisfy energy needs.

Notes:

- This includes energy for fans, pumps, electronics, etc. Electrical energy input to the ventilation system for air transport and heat recovery is not considered as auxiliary energy, but as energy use for ventilation.
- In EN ISO 9488, Solar Energy – Vocabulary, the energy used for pumps and valves is called “parasitic energy”.

AREA DEFINITIONS

Form factor A/V [m⁻¹] (*IEA SHC task 37 glossary*)

The ratio between the building envelope area and the gross building volume.

Building envelope area A [m²] (*IEA SHC task 37 glossary*)

Total external area of the building envelope enclosing the heated volume – façade (including doors and windows), roof and ground – and measured at the outer boundaries of the building.

Gross volume V [m³] (*IEA SHC task 37 glossary*)

The heated building volume calculated on the basis of the outer dimensions.

Gross floor area (*DIN 277*)

Total floor area of all floors of a building calculated with the external dimensions of the building including structures, partitions, corridors and stairs.

Note:

- *From task 37 Glossary: Area which is conditioned / heated on the basis of outer dimensions*

Net heated volume VN [m³] (*IEA SHC task 37 glossary*)

The heated volume calculated on the basis of the internal dimensions.

Net heated floor area AN [m²] (*DIN 277*) [ISO 9836](#)

Sum of all areas between the vertical building components (walls, partitions ...); i.e. gross floor area reduced by the area for structural components

Note:

- *Task 37 Glossary: The sum of the floor areas of all heated rooms including heated corridors and heated internal stairways but not unheated rooms.*

BUILDING CATEGORIES

Net zero energy building (*IEA SHC task 37 Glossary*)

A building where the net energy consumed over a year is matched by an equal amount of energy produced on site.

Zero emission building (*IEA SHC task 37 Glossary*)

A building without energy generation related CO₂ emissions.

Net zero emission building (*IEA SHC task 37 Glossary*)

A building with CO₂ emissions that are balanced over the course of the year. Consumption related CO₂ emissions are counterbalanced by energy generation based on renewable energy. This is possible on-site and off-site.

Passive House (*Passive House Institute in Germany*)

According to the definition provided by the Passive House Institute in Germany, the following requirements have to be fulfilled: a maximum end-energy space heating, demand of 15 kWh/m²a, a primary energy demand for all end-uses including electricity for appliances which is not higher than 120 kWh/m²a, and an air-tightness of the envelope of 0.6 by 50 Pa overpressure.

Notes:

- *There are several national varieties to this standard*

Low energy building (*IEA SHC task 37 Glossary*)

Buildings with the explicit intention of using less energy than standard buildings. However, no specific requirements are defined. Norway: NS3700: Buildings using 25% less energy than the standard building code.

Plus energy building (*IEA SHC task 37 Glossary*)

A building where more primary energy is produced annually than consumed. Typically a net zero is reached by generating on-site electricity which has a high primary energy replacement value and can therefore be credited against thermal energy demand which has a lower primary energy factor.

NZEB

- Net zero Energy Buildings (IEA)
- Nearly Zero Energy Buildings (EU)



OTHERS

Specific Fan Power (SFP) (Norwegian Standard NS 13779) Corresponds to [DIN EN 13779 Ventilation for non-residential buildings](#)

SFP for buildings or complete systems is the sum of electric power needed by all fans in the air distribution system divided by the total amount of air ventilating (supply and exhaust) the building during design load period.

$$SFP = \frac{\sum P}{q_v}$$

SFP can be expressed in the following equivalent SI units:

$$[SFP] \equiv \frac{kW}{m^3/s} \equiv \frac{W}{l/s} \equiv \frac{kJ}{m^3} \equiv kPa$$